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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,572	01/12/2004	Mun-Pyo Hong	6192.0158D1	8242

7590 12/10/2004  
McGuireWoods LLP  
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EXAMINER

FENTY, JESSE A

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	Application No. 10/754,572	Applicant(s) HONG ET AL.	
	Examiner Jesse A. Fenty	Art Unit 2815	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-15 and 45-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-15 and 45-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/12/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 10 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ahn (U.S. Patent No. 6,011,309).

In re claim 10, Ahn discloses a semiconductor device, comprising:

a wire (115) of a conductive material on a substrate;

an inter-layer reaction layer (135) formed on the wire and including a transition metal;

and

a conductive layer (153) electrically connected to the wire via the inter-reaction layer.

In re claim 13, Ahn discloses the device of claim 10, wherein the inter-layer reaction layer is an inter-metallic compound layer (column 5, lines 45-50).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 10, 11, 14, 15 and 45-49 are rejected under 35 U.S.C. 102(e) as being anticipated by Dojo et al. (U.S. Patent No. 6,528,357 B2).

In re claim 10, Dojo (esp. Fig. 2) discloses a semiconductor device, comprising:

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a wire (126b) of a conductive material on a substrate;

an inter-layer reaction layer (127) formed on the wire and including silicon (column 4, lines 16-17); and

a conductive layer (131) electrically connected to the wire via the inter-reaction layer.

In re claim 11, Dojo discloses the device of claim 10, wherein the wire is made of a conductive material including aluminum-based material (column 10, lines 66-67; column 11, lines 1-3).

In re claim 14, Dojo discloses the device of claim 10, wherein the conductive layer is made of a transparent conductive material of indium zinc oxide (column 11, lines 31-34).

In re claim 15, Dojo discloses the device of claim 10, further comprising an insulating layer (141) having a contact hole exposing the inter-layer between the wire and conductive layer.

In re claim 45, Dojo (esp. Fig. 2) discloses a semiconductor device, comprising:

a gate wire (111) of a first conductive material on an insulating substrate (101);

a gate insulating layer (117) covering the gate wire;

a semiconductor layer (120) formed on the gate insulating layer;

a data wire (126b) made of a second conductive material on the gate insulating layer and the semiconductor layer;

a passivation layer (127) covering the data wire;

an inter-layer reaction layer (141) formed on the gate wire and the data wire; and

a transparent conductive layer pattern (131) electrically connected to the data wire (126b) through the passivation layer via a first contact hole.

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In re claim 46, Dojo discloses the device of claim 45, wherein the first (column 3, lines 59-60) and the second (column 10, lines 66-67; column 11, lines 1-3) conductive material include a metal of aluminum-based material.

In re claim 47, Dojo discloses the device of claim 45, wherein the insulating layer (117) comprises silicon nitride (column 10, line 24) and the passivation layer (127) is made of silicon nitride (column 4, lines 16-17).

In re claim 48, Dojo discloses the device of claim 45, wherein the transparent conductive layer pattern (131) is made of indium zinc oxide (column 11, lines 31-34).

In re claim 49, Dojo discloses the device of claim 45, wherein the gate wire includes a gate line (111a), a gate electrode (111) connected to the gate line, and a gate pad (152) which is connected to the gate line and receives a signal from an external circuit (column 8, lines 48-67; column 9, lines 1-6), and the data wire includes a data line (125b), a source electrode connected to the data line, a drain electrode (126a) which is separated from the source electrode and opposite to the source electrode with respect to the gate electrode, and a data pad which is connected to the data line and receives a signal from an external circuit.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dojo as applied to claim 11 above, and further in view of Hyun (U.S. Patent No. 5,814,836).

In re claim 12, Dojo discloses the device of claim 11, but does not expressly disclose the inter-layer reaction layer including at least  $\text{AlxSix}$ . Hyun (esp. Fig. 3G) discloses an inter-layer reaction layer 143(b) comprising  $\text{AlSi}$ . It would have been obvious for one skilled in the art at the time of the invention to use an  $\text{AlSi}$  inter-layer layer as disclosed by Hyun for the device of Dojo for the purpose, for example, of enhancing the conductivity to the pixel electrode.

6. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dojo as applied to claim 45 above, and further in view of Hirano et al. (U.S. Patent No. 5,771,110).

In re claim 50, Dojo discloses the device of claim 45, but does not expressly disclose the inter-layer reaction layer comprising silicon. Hirano disclose an inter-layer reaction layer (73) comprising silicon dioxide. It would have been obvious for one skilled in the art at the time of the invention to construct the inter-layer layer of Dojo of silicon dioxide as disclosed by Hirano for the purpose, for example, of simplifying the manufacturing process.

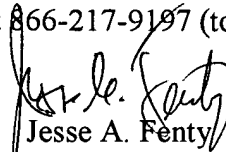
### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 571-272-1729. The examiner can normally be reached on 5/4-9 1st Fri. Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jesse A. Fenty  
Examiner  
Art Unit 2815